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POSEIDON 2 LEVEL 1.0 PROCESSING

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ABBREVIATIONS

Sigle	Definition
ADA	Algorithms Definition and Accuracy
ADx	Applicable Document x
AGC	Automatic Gain Control
APID	Application Process Identifier
CAL	Calibration
CLS	Collecte Localisation Satellites
CMA	Centre Multi-missions Altimètre
CNES	Centre National d'Etudes Spatiales
COG	Centre of Gravity
DAD	Dynamic Auxiliary Data
ET	Earth Terminal

GPS	Global Positioning System
HKTM	HouseKeeping TeleMetry
IAT	International Atomic Time
IGDR	Interim Geophysical Data Record
JCCC	Jason Control Command Center
JPL	Jet Propulsion Laboratory
JSDS	Jason Science Data System
JTCCS	Jason Telemetry Command and Control System
LPF	Low-Pass Filter
NASA	National Aeronautics and Space Agency
NRT	Near Real Time
OFL	Off-Line
PF	Platform
PLTM	PayLoad TeleMetry
POS2	POSEIDON 2
PTR	Point Target Response
RDB	Radar DataBase
RDx	Reference Document x
SAD	Static Auxiliary Data
SGDR	Sensor Geophysical Data Record
SSALTO	Segment Sol Altimétrie, Orbitographie et Localisation Précise
SSPA	Solid State Power Amplifier
SWH	Significant Waveheight
TBC	To Be Confirmed
TBD	To Be Defined
TM	Telemetry
USO	Ultra-Stable Oscillator
UTC	Universal Time Co-ordinated

APPLICABLE AND REFERENCE DOCUMENTS

Reference		Document title
SMM-ST-M-EA-10600-CN	AD1	Spécifications techniques de besoins du Segment Sol Multi-Missions SSALTO
TP2-SB-J0-100-CNES	AD2	JASON System Requirements
TP2-JS-IF-600-CNES	AD3	Jason Ground System Interfaces
SMM-ST-M-EA-11442-CN	AD4	Level 1.0 Navigation Data processing definition
SMM-ST-M-EA-11462-CN	AD5	Spécifications techniques du traitement sol des télémesures POSEIDON2
SMM-ST-M1-EA-11577-CN	AD6	JMR Level 1.0 processing
PRO-LS-DC-10090-CNES	AD7	PGGS Internal and External Interfaces Specifications.
TP2-JALT-NT-704-CNES	AD8	Définition de l'algorithme de décompression des échos de l'altimètre POSEIDON2
In progress	AD9	Spécifications des interfaces internes CCI

SMM-IF-M-EA-20054-CN	AD10	Catalogue des interfaces SSALTO
SMM-IF-M-EA-20055-CN	AD11	Dossier de spécifications des interfaces internes SSALTO
SMM-ST-M-EA-11443-CN	AD12	Level 1.0 DORIS Time-Tag Data processing definition
SMM-ST-M2-EA-10880-CN	RD1	Algorithm Definition and Accuracy Volume 2: CMA Altimeter Level 1b Processing
SMM-ST-M2-EA-10882-CN	RD2	Algorithm Definition and Accuracy Volume 4: CMA Altimeter Level 2 Processing
TP-ST-6135-266-CLS	RD3	Spécifications des algorithmes de la chaîne de traitement des données altimètriques du niveau 1.0 au niveau 1.1
ALT-NT-1000-313-ATS	RD4	Manuel Utilisateur de l'altimètre POSEIDON2
SMM-ST-M-EA-11462-CN	RD5	Spécifications techniques du traitement sol des télémesures POSEIDON2.

TBC AND TBD LIST

TBC/TBD	Paragraph	Brief description
TBC	4.2.3.1	Time of reception of the first pulse
TBC	4.2.3.4	Accuracy of the algorithm
TBC	4.2.3.5	Formula of the time-tag of the measurement to the sea surface depending if it refers to the emission or the reception of the pulse
TBC	4.2.3.5	Accuracy condition of the algorithm
TBC	4.2.7	Accuracy of the algorithm
TBC	4.2.7	Use a null values to complete PTR Level 1.0 product
TBC	4.2.9	Report file as an interface between level 1.0 processing and CMA
TBC	5.2.2	Rate for estimation of expected ALTI measurements
TBC	5.2.2	Tolerance for estimation of expected ALTI measurements
TBD	4.2.9	Precise content of report file
TBD	5.2.1	RDB parameters

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1. INTRODUCTION

1.1. PURPOSE

This document is aimed at defining the Level 1.0 processing of the POSEIDON2 altimeter (POS2).

It describes the requirements of the processing to get POS2 Level 1.0 products from level 0 data.

The level 1.0 processing is the first phase of the production of NRT or Offline POS2 products (OSDR, IGDR, GDR or SGDR see RD1and RD2) to be generated in the Jason Ground Segment (see AD2). It is implemented in CCI of SSALTO and in the JSDS. Moreover, level 1.0 products are involved in the monitoring of POS2 realised in SSALTO:

- in CCI with the HK 1.0 product, the DU 1.0 product, the ACQ 1.0 product and the ALTI 1.0 product,
- in CMA with PTR 1.0 product and LPF 1.0 product.

Only JSDS produces the JASON NRT products during the routine phase, in operational manner.

The main steps identified in the POS2 Level 1.0 processing are:

- the extraction of raw measurements from PLTM packets,
- the generation of level 1.0 products,
- the monitoring of POS2 from ALTI and ACQ level 1.0 products to control the behaviour of POS2.

This document is aimed at identifying and describing the main functions of each processing step. It must be considered as the basic input for the detailed requirements of the processing, and not of course as the detailed requirements themselves.

Reception of level 0 data in PLTM packets (HK, ALTI, CAL1/CAL2, ECHO1/ECHO2/EHO3, DU, ACQ/ACC source packets of Operational Science Data and Science Raw Data) is not detailed here because this function is specific to JSDS or to SSALTO (described in AD5 for SSALTO).

As the generation of the products is generic, the generation of HK, PTR, LPF and DU level 1.0 products are described here. However, the monitoring of POS2 from the HK 1.0 product and DU 1.0 product is only realised in SSALTO/CCI and not in the JSDS, and is thus described in RD5.

Monitoring from the level 1.0 altimeter and ACQ products validates the correct behaviour of the altimeter, and so it shall be implemented both in SSALTO/CCI and in JSDS. Hence, its description is in this document.

1.2. ORGANISATION OF THE DOCUMENT

The product tree (see **Figure 1** below) points out the main features of the POS2 level 1.0 processing (grey cells) and of the corresponding output data (white cells are interfaces).

The interfaces of the processing (input and output data) are defined in section 2.

Extraction of instrument measurements is defined in section 3.

Generation of each level 1.0 product is defined in section 4.

Monitoring of the POS2 instrument is defined in section 5, so far as it concerns both CCI and JSDS.

For each processing, the definition consists in:

- An overview of the overall processing (brief description of the processing and list of functions). Be aware that functions which proceed with data management or quality check, such as for example:
    - To get and prepare input data from disk space,
    - To check input data,
    - To convert units,
    - To manage the processing,

are generally not detailed in this document, because they are not considered as critical items in the framework of the present processing definition. They will be represented and described more accurately in another document during the processing detailed requirements phase.

- A detailed description of all the functions.

For each function, the following items are used:

- Name,
- Function description,
- Applicability,
- Input data:
    - Product data: data coming from the telemetry
    - Computed data: data issued from a previous algorithm
    - Dynamic auxiliary data: time-varying auxiliary data
    - Static auxiliary data: constant auxiliary data
- Output data

- Statement
- Accuracy (if any)
- Comments (if any)
- References (if any)

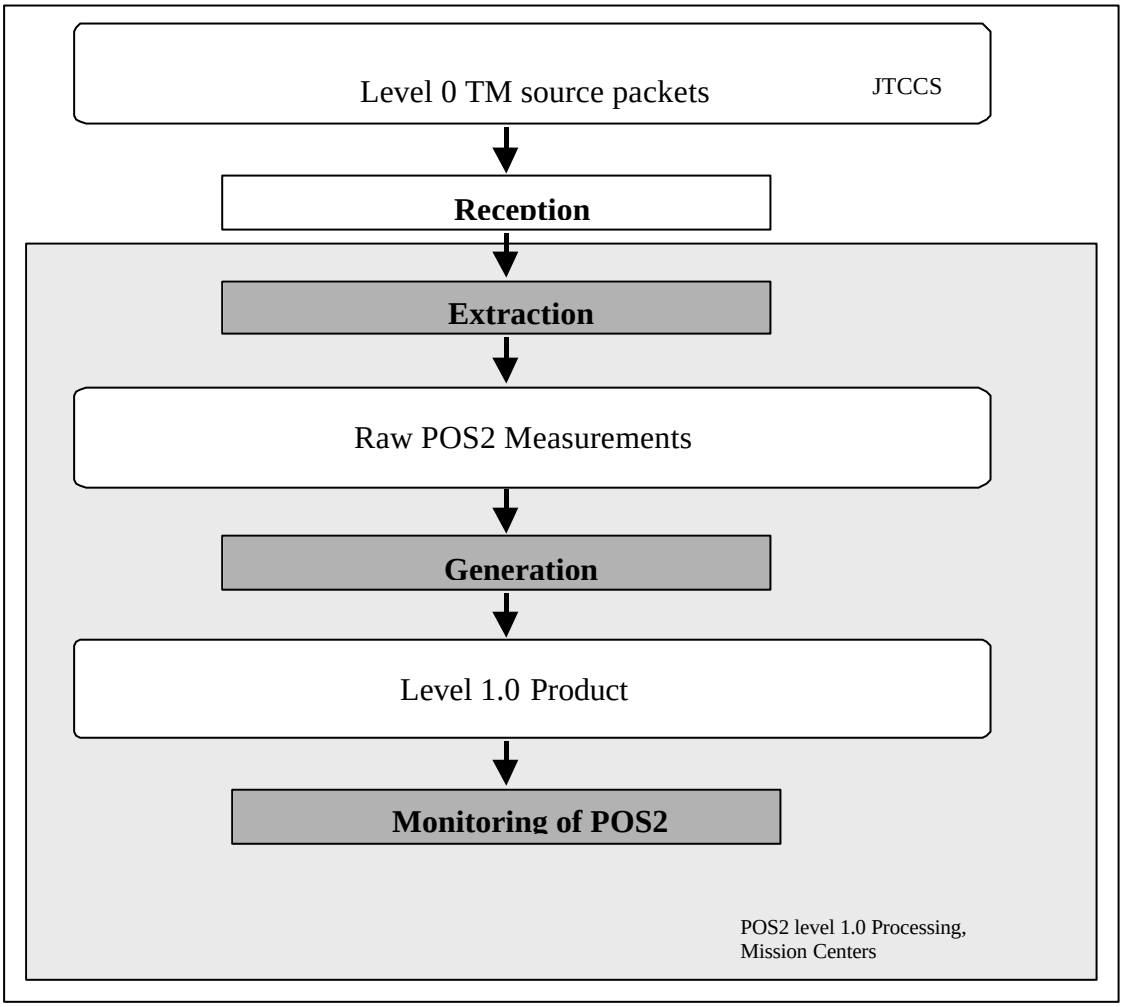


Figure 1: Product tree (POS2 level 1.0 processing)

1.3. SCOPE

Some level 1.0 products (HK, PTR, LPF) are not used in the NRT production. The applicability of their generation is thus restricted to CCI. Others functions have to be implemented in both CCI and JSDS.

2. INPUT AND OUTPUT DATA

2.1. INPUT DATA

Two types of input data may be discriminated:

- JTCCS Level 0 PLTM packets, which correspond to raw data produced by the altimeter in a JTCCS format;
- Auxiliary data, which may be dynamic or static:
    - Dynamic auxiliary data (DAD) are time-varying data,
    - Static auxiliary data (SAD) are constant data.

2.1.1. LEVEL 0 PLTM PACKETS

Raw data are generated by POS2 in source packets delivered by the platform in frames (see AD3 and RD4). They are identified by a specific Application Processus IDentifier.

One Earth Terminal of the Jason ET Network (see AD2) receives all the APID as PLTM frames during the satellite visibility. This set of frames is called a segment of data and is sent to JTCCS. Then, for each APID, JTCCS generates JTCCS packets (see AD3) from these frames.

For our purpose, these APIDs are gathered in two main sets:

- the Operational Science Data (from PLTM1 platform memory),
- the Raw Science Data (from PLTM2 platform memory) whose priority is lower in terms of downlink operations, since Operational Science Data is used for NRT processing.

The Operational Science Data is composed of (see AD2):

- Level 0 Navigation Data Source Packets,
- Level 0 Time-Tag Data processed by DORIS,
- Level 0 POS2 source packets for NRT processing:
    - ACQ/ACC APID, for the report of the POS2 tracking,
    - ALTI APID, for on-board processed altimeter measurement,
- Level 0 JMR source packets.

The Raw Science Data is composed of (see AD2):

- Level 0 POS2 source packets for NRT processing or OFL processing:
    - HK APID, one packet every 5s for the housekeeping information given by POS2,
    - DU APID, for the dump of POS2 memory,
    - CAL1 APID, for the low pass filter characteristics,
    - CAL2 APID, for the point target response characteristics,
    - ECHO1, ECHO2, ECHO3 APIDs, for waveforms.
- Level 0 DORIS scientific data,
- Level 0 TRSR data.

The POS2 APIDs are the inputs for the POS2 level 1.0 processings.

The processing of Navigation data is defined in AD4. The processing of IAT DORIS Time-Tag Data is defined in AD12. The outputs of these two processings are inputs for the POS2 Level 1.0 Processing.

The POS2 or PF APID of the Housekeeping Telemetry are not described here but in RD5 They are not explicit inputs for Level 1.0 processing but are useful for the monitoring of the instrument (see RD5).

2.1.2. AUXILIARY DATA

2.1.2.1. Dynamic auxiliary data

Specific dynamic auxiliary data consist of:

- the last time-tag of previous processed data (used to detect lack of telemetry), defined in AD9,
- the telecommand history (used for PTR and LPF processing), defined in AD9.

2.1.2.2. Static auxiliary data

- Static auxiliary data consist of constant processing parameters such as:
- Thresholds to check quality, defined in AD9,
- UTC-IAT Differences, defined in AD9,
- polynomial transfer functions, defined in AD9,
- decommutation tables described in the Satellite Database from JCCC (see AD3) and defined in AD9,
- Radar Data Base parameters,
- POS2 configuration file describing POS2 instrument parameters, defined in AD11.

RDB parameters may changed by software uploads. This operation is exceptional, but as RDB parameters are inputs for the altimeter level 1.0 generation, NRT and OLF processing, they may be updated by the Dump level 1.0 generation.

2.2. OUTPUT DATA

2.2.1. LIST OF OUTPUTS

POS2 level 1.0 processing outputs are:

- the Level 1.0 Altimeter product, ALTI,
- the Acquisition 1.0 product, ACQ,
- the Dump 1.0 product, DU,
- the HouseKeeping 1.0 product, HK,
- the Low Pass Filter 1.0 product, LPF,
- the Point Target Response 1.0 product, PTR.

An auxiliary product describes the configuration of the altimeter within the period of the input packets.

These products are the input of the CMA for further altimeter processing steps.

The Altimeter 1.0 product may be processed twice:

- it is first generated from information contained in Operational Science Data to compute OSDRs as soon as possible in JSDS,
- once Raw Science Data are available, it is filled with complementary information needed for accurate OFL processing..

Altimeter and Acquisition level 1.0 products are used for POS2 monitoring in CCI in SSALTO and in JSDS.

HouseKeeping Level 1.0 product are used for POS2 monitoring in CCI only (see RD5).

Dump Level 1.0 is used to update RDB parameters in CCI and JSDS. If an update is made for a segment of data and if the corresponding altimeter level 1.0 product has been already created (operational science data are received first), CCI and JSDS shall process again the altimeter level 1.0. The altimeter level 1.0 product and therefore the OFL products will be so produced with the correct values of RDB parameters.

POS2 monitoring in CCI (see RD5) also uses Dump level 1.0 product.

Altimeter level 1.0 Product and the associated RDB parameters are delivered to CMA in SSALTO and to JSDS for NRT or OFL processing.

LPF and PTR level 1.0 products are delivered only to SSALTO/CMA.

A report file, as defined in AD9, is generated for each level 1.0 product. It contains:

- statistics: number of valid data, number of error data, number of redundant data, etc.
- product characteristics: mission id, data time window, etc.

2.2.2. MAIN CHARACTERISTICS OF LEVEL 1.0 PRODUCTS

These outputs are level 1.0 products and therefore:

- correspond to a segment of data without redundant information,
- are chronologically ordered,
- data are in physical values,
- IAT time is used,
- All parameters have been checked and quality flags are set.

2.3. SUMMARY OF THE INTERFACES

The interfaces of the POS2 level 1.0 processing are summed up in **Figure 2**

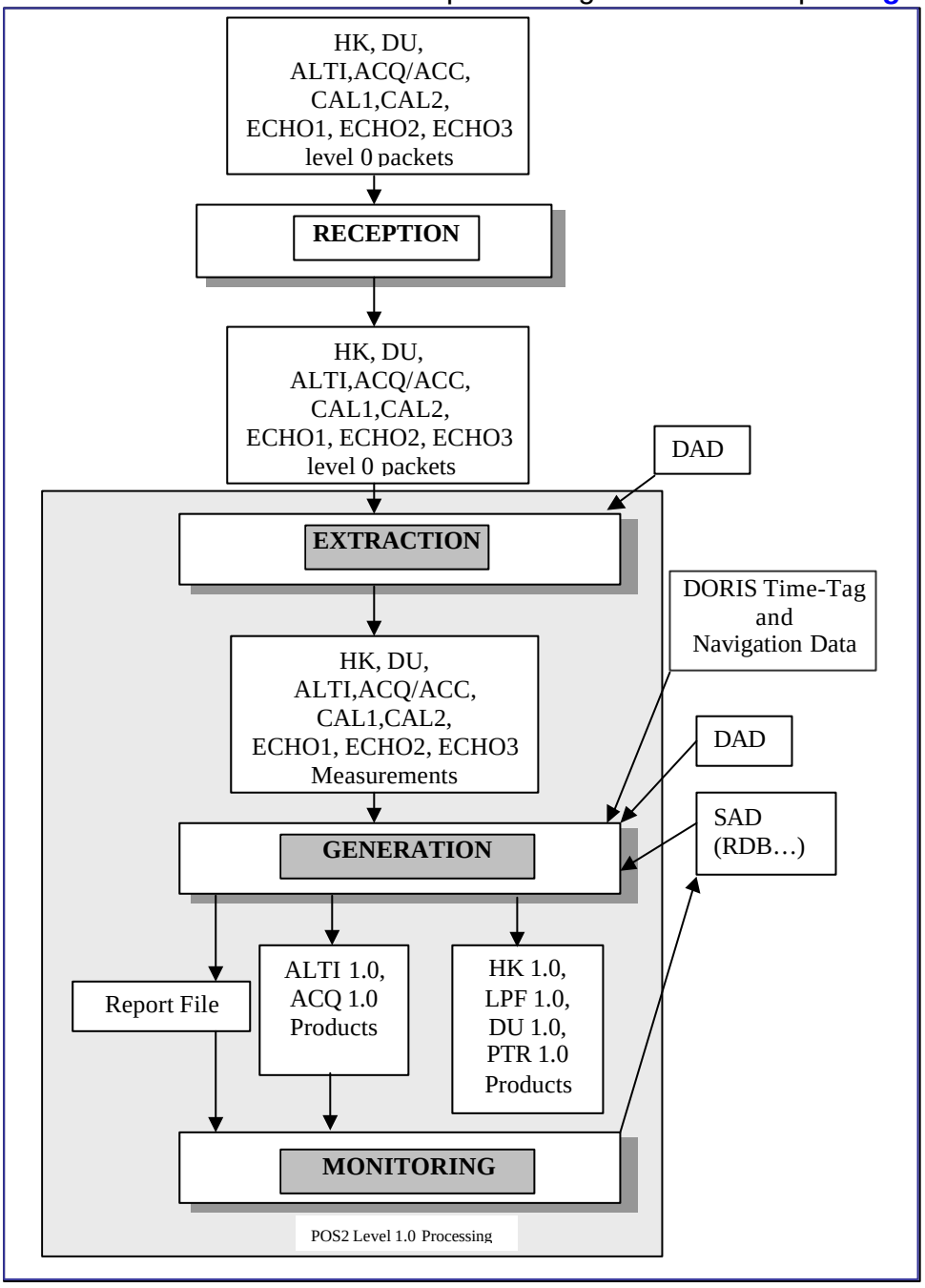


Figure 2: Interfaces of the POS2 level 1.0 processings

3. "EXTRACTION" PROCESSING

3.1. PROCESSING OVERVIEW

3.1.1. BRIEF DESCRIPTION

Once data are collected by the Reception processing, the Extraction processing extracts raw POS2 measurements from level 0 JTCCS PLTM packets and removes extra information added by the JTCCS. Raw measurements are described in RD4.

Extraction processing has to detect lacks of TM. The relevant time information used to perform this monitoring is the platform time, i.e. GPS-UTC creation time, of the JTCCS PLTM packets. This detection is performed using ALTI source packets delivered in the operational science data, or HK source packets of the science raw data.

For Jason, data are chronologically ordered in each JTCCS PLTM packet due to the protocol of exchange between the instruments and the satellite platform. Moreover, there is no overlap between data segments thanks to the organisation of the dump of the platform memory. If JTCCS detects a lack of telemetry after a downlink, then telemetry is not delivered to the others components of the Jason ground segment. A second dump of the PF memory is performed and checked before delivery of the whole downlinked telemetry.

Thus, Extraction processing does not check the chronology of level 0 POS2 PLTM packets. It processes data in the same order as their reception.

3.1.2. LIST OF FUNCTIONS

A list of the functions of the Extraction processing is given in **Figure 3**.

FUNCTION
TO DETECT LACKS OF TELEMETRY
TO EXTRACT RAW MEASUREMENTS FROM JTCCS SOURCE PACKETS

Figure 3: Functions of the Extraction processing

3.2. FUNCTIONS

A detailed description of the functions of the Extraction processing is given in this section.

3.2.1. TO DETECT LACKS OF TELEMETRY

Function

This function checks the UTC GPS on-board creation time from the ALTI or HK source packets to detect lacks in the telemetry.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: Current and previous HK or ALTI PLTM source packet, from JTCCS files defined in AD3.
- Computed data: UTC GPS Time-Tag of the last HK source packet.
- Dynamic auxiliary data: None
- Static auxiliary data:
    - Extraction processing configuration file defining the acceptable telemetry time gap and the processing configuration.

Output data

- Continuity Check Status
- Duration Gap

Statement

This function checks that there is no more than the acceptable duration lack between two consecutive level 0 data source packets (test of the UTC on-board creation time difference between the current packet and the previous packet, relative to the acceptable telemetry gap). If a continuity default is detected, this function returns a significant status of the continuity check and the value of the duration gap.

Accuracy None

Comments The choice between HK and ALTI APID will be tuned during assessment phase.

References None

3.2.2. TO EXTRACT RAW MEASUREMENTS FROM JTCCS SOURCE PACKETS

Function

This function extracts raw POS2 measurements from JTCCS level 0 source packets.

Applicability

CCI/SSALTO for all APID, JSDS for all APID except CAL1, CAL2 and HK APID.

Input data

- Product data:
    - JTCCS source packet, one file per APID, as defined in AD3.
- Computed data: None
- Dynamic auxiliary data: None
- Static auxiliary data: None.

Output data

- Raw TM, one file per APID.

Statement

This function generates APID raw measurements files per APID from the JTCCS PLTM files by removing headers described in JTCCS interfaces (see AD7).

Accuracy None

Comments None

References None

4. "GENERATION OF LEVEL 1.0 PRODUCTS" PROCESSING

4.1. PROCESSING OVERVIEW

The generation of level 1.0 products processing creates all the POS2 level 1.0 products from the extracted APIDs.

4.1.1. BRIEF DESCRIPTION

A brief overview of the main functions of the Generation processing is given in this section. A detailed description is provided in section 4.2.

Common operations are used to generate any level 1.0 product (upper level function):

- To extract a parameter,
- To apply a transfer function,
- To check a parameter value,
- To convert UTC time in IAT,
- To time-tag measurement with IAT DORIS time.

As these five functions are generic, their description in the section 4.2.1 prevents from duplication of text.

If a processing is similar but a little different for an APID, several functions will be described for a better understanding.

In following sections 4.2.x, for each raw POS2 measurement APID, the description of the Generation processing of Level 1.0 processing is given. If necessary, specific sub-functions not described in section 4.2.1 have been identified to make the processing more understandable. The statement part of the description of a upper level refers to the generic functions if necessary and to the specific ones.

The order of the description of the functions respects their chronology.

4.1.2. LIST OF FUNCTIONS

A list of the functions of the Generation of level 1.0 products processing is given in **Figure 4**. Specific sub-functions appear in lower characters.

FUNCTION
Generic sub-functions
TO EXTRACT A PARAMETER
TO APPLY A TRANSFER FUNCTION
TO CHECK A PARAMETER VALUE
TO CONVERT UTC TIME IN IAT
TO TIME-TAG MEASUREMENT WITH IAT DORIS TIME
Functions
TO GENERATE THE ACQUISITION LEVEL 1.0 PRODUCT
TO GENERATE ALTIMETER 1.0 PRODUCT FROM OPERATIONAL SCIENCE DATA
To determine the precise time-tag
To refer the time-tag to the middle of the measurement
To apply the correction time-tag bias
To compute altitude, radial velocity and location
To refer the time-tag to the sea surface
To check on-board tracking and estimates
TO COMPLETE ALTIMETER 1.0 PRODUCT WITH SCIENCE RAW DATA
To look for ECHO1, ECHO2, ECHO3
To decompress ECHO1, ECHO2 and ECHO3
To check restored packets
To integrate packets in the Altimeter 1.0 product
TO GENERATE DUMP LEVEL 1.0 PRODUCT
TO GENERATE HOUSEKEEPING LEVEL 1.0 PRODUCT
TO GENERATE POINT TARGET RESPONSE 1.0 PRODUCT
To look for time-tag and number of spectra of TC-CAL1
To order the CAL1 spectrum
To check the PTR validity
TO GENERATE LOW PASS FILTER 1.0 PRODUCT
To look for time-tag and number of calibrations of TC-CAL2
To order the CAL2 spectrum
To check the LPF validity
TO GENERATE A REPORT FILE OF LEVEL 1.0 PROCESSING

Figure 4: Functions of the POS2 Generation processing

4.2. FUNCTIONS

A detailed description of the functions of the Generation processing is given in this section.

4.2.1. GENERIC SUB-FUNCTIONS

4.2.1.1. To extract a parameter

Function

This function extracts a parameter from a raw APID source packet.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data:
    - Raw APID source packet.
- Computed data: None
- Dynamic auxiliary data: None
- Static auxiliary data: Decommutation tables (see AD9).

Output data

- Raw parameter.

Statement

This function extracts a parameter from the raw measurement source packet from a start position byte until an end position given in a decommutation table.

Accuracy None

Comments None

References None

4.2.1.2. To apply a transfer function

Function

This function converts in physical value a parameter extracted by the “To Extract a Parameter” function.

A polynomial function is applied for this operation.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: None
- Computed data: Raw Parameter, output from “To Extract a Parameter”.
- Dynamic auxiliary data: None
- Static auxiliary data: polynomial transfer functions (see AD9).

Output data

- Parameter in physical value.

Statement

This function applies a polynomial function to a raw parameter to get its physical value.

Accuracy None

Comments None

References None

4.2.1.3. To check a parameter value with respect to thresholds

Function

This function checks the physical value of a parameter computed by the “To Apply a transfer” function.

The physical value is compared to a minimal and a maximum threshold.

A quality flag is thus computed in coherence with the flagging strategy defined for the CMA.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: None
- Computed data: Physical Value, output from “To Apply a Transfer Function”.
- Dynamic auxiliary data: None
- Static auxiliary data: Thresholds (see AD9).

Output data

- Flag value, set to “valid” or “non valid” or “missing” when default value is assigned to the parameter

Statement

This function checks if the value lies in an acceptable interval.

Accuracy None

Comments None

References None

4.2.1.4. To convert UTC time in IAT

Function

This function converts the UTC time into IAT time by addition of the UTC-IAT time difference.

The UTC/IAT difference has to be initialised from a static auxiliary data.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data:
    - GPS UTC on-board creation time from a source packet APID (see RD4).
- Computed data:
- Dynamic auxiliary data: None
- Static auxiliary data: UTC/IAT time differences (see AD9).

Output data

- IAT Creation Time of the source packet.

Statement

Find out the UTC/IAT difference at the UTC time.

Add this difference to the UTC time to get the IAT time.

Accuracy None

Comments None

References None

4.2.1.5. To time-tag measurement with IAT DORIS time

Function

This function associates the IAT creation time of a source packet APID with the IAT Time delivered by DORIS for the same GPS pulse. For the ALTI measurements, this function computes the precise time of the measurement.

Applicability

CCI/SSALTO and JSDS

ALTI, ACQ, ECHO and CAL source packets only

Input data

- Product data:
    - Time-Tag Data (output from time-tag processing, see AD9),
    - GPS UTC on-board time from a source packet APID (see RD4).
- Computed data: IAT Creation Time-Tag of a raw measurement source packet.
- Static auxiliary data: None
- Dynamic auxiliary data: level 1.0 Time-Tag data product of the segment of data.

Output data

- T_{IAT} , IAT Time of the source packet.

Statement

This function reads all the IAT creation time and IAT corresponding time of time-tag data delivered by DORIS for the data. As all APIDs are chronologically ordered, the correspondence between the IAT creation time of the POS2 measurement source packet and the IAT creation time of time-tag data is easy.

When found, T_{IAT} is defined as the corresponding IAT time delivered by DORIS.

Remark 1: if no Time-Tag IAT is available (on a DORIS failure for example), T_{IAT} is set to the IAT creation time.

Remark 2: even if the GPS UTC time delivered by the platform is not significant, the Generation of the level 1.0 Time-Tag data product provides a IAT extrapolated time as POS2 for the UTC.

Remark 3: If no GPS pulse is delivered, no data is generated by the instruments.

Important: For the ALTI source packet, this function determines also the on-board precise time extracted from this packet. The on-board precise time is computed with the number of steps of a clock after the delivering of the GPS pulse by the platform. The frequency of this clock is 8/(15*11) times the DORIS OUS frequency.

Accuracy less than 10 µs from the IAT Time

Comments None

References None

4.2.2. TO GENERATE THE ACQUISITION LEVEL 1.0 PRODUCT

Function

This function summarises the generation of acquisition level 1.0 product.

Applicability

CCI/SSALTO, JSDS.

Input data

- Product data: raw ACQ/ACC measurements from “Extraction”
- Computed data: None
- Dynamic auxiliary data:
    - Level 1.0 Time-Tag Data product, output of the DORIS Time-Tag Processing (see AD12).
- Static auxiliary data: Decommutation Table, Transfer Functions, Thresholds for ACQ/ACC parameters (see AD9).

Output data

- Level 1.0 ACQ product.

Statement

This function generates the Level 1.0 ACQ product by applying:

- the “To convert UTC time in IAT” and “To time-tag measurement with IAT DORIS time” functions for each measurement,
- the “To Extract a Parameter”, “To Apply a Transfer Function”, “To Check a Parameter Value” functions for each parameter of the ACQ/ACC source packet (see RD4).

Accuracy None

Comments None

References None

4.2.3. TO GENERATE ALTIMETER 1.0 PRODUCT FROM OPERATIONAL SCIENCE DATA

Function

This function is aimed to produce the Altimeter Level 1.0 product used in NRT production of the CMA.

Specific sub-functions identified for this function are:

- To determine the precise time-tag
- To refer the time-tag to the middle of the measurement
- To apply the correction time-tag bias
- To compute altitude, radial velocity and location
- To refer the time-tag to the sea surface
- To check on-board tracking and estimates

Applicability

CCI/SSALTO and JSDS

Input data

- Product data:
    - Raw ALTI measurement from “Extraction”
- Computed data: None.
- Dynamic auxiliary data:
    - Level 1.0 Time-Tag Data product, output of the DORIS Time-Tag Processing (see AD12).
    - Segment Navigator Ephemeris, output of the Navigation Data processing (see AD4).
- Static auxiliary data: Decommutation Table, Transfer Functions, Thresholds for ALTI parameters, Radar Database Parameters.

Output data

- ALTI 1.0 Product (without Raw Science Data information).

Statement

This function generates the Altimeter Level 1.0 product by applying:

- the “To convert UTC time in IAT”, “To time-tag measurement with IAT DORIS time”, “To determine the precise time-tag”, “To refer the time-tag to the middle of the measurement”, “To apply the Time-tag bias”, “To compute altitude…” to get the altitude,
- “To refer the time-tag to the sea-surface” functions to get the time-tag of the measurement,
- “To compute altitude, radial velocity and locations”,
- the “To Extract a Parameter”, “To Apply a Transfer Function” functions for each parameter of the ALTI source packet (see RD4),
- “To Check on-board tracking and estimates” using “To Check a Parameter Value” in order to validate the product data.

The fields of the ALTI 1.0 product data corresponding to the Science Raw Data information are initialised with default values.

Accuracy Computed data depend on RDB parameters. So as to simplify this processing and to be able to process OSDR in a timely manner, RDB parameters are considered as static inputs. If a change of NIMP or PRF RDB parameters is done and detected once the Science Raw Data is received, the product shall be generated again.

Comments None

References None

4.2.3.1. To determine the precise time-tag

Function

This sub-function adds the precise time of the ALTI measurement, time of the reception (TBC) of the first pulse of the last packet of the measurement.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: T_{PTT} Precise Time of the ALTI measurement.
- Computed data: T_{IAT} , IAT Time of the source packet
- Dynamic auxiliary data: None
- Static auxiliary data: None.

Output data

- $T_{1,Last:}$ IAT Time of the first pulse of the last packet of the measurement.

Statement

$T_{1,Last} = T_{IAT} + T_{PTT}$

Accuracy T_{PTT} is known with a 5 µs precision.

Comments None

References None

4.2.3.2. To refer the time-tag to the middle of the measurement

Function

This sub-function estimates the time-tag of the middle of the measurement, i.e. to the middle of the middle packet of the measurement, even if not valid.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: NVP, number of valid packets in the ALTI measurement.
- Computed data: $T_{1,Last:}$ IAT Time of the first pulse of the last packet of the measurement
- Dynamic auxiliary data: None
- Static auxiliary data (see AD9):
    - PRF, NIMP from RDB,
    - MP: maximum of packets in a measurement from POS2 configuration file.

Output data

- $T_{MID,MID}$ = IAT Time of the middle of the measurement.

Statement

$T_{MID,MID} = T_{1,LAST} - (NVP - 1)*NIMP*PRF$ //to get the time of the first pulse of the first packet
$+ (MP - 1)*NIMP*PRF/2$ //to get the time of the 1st pulse of the middle packet
$+ (NIMP - 1) * PRF/2$ //to get the time of the middle of the middle packet, //i.e. the middle of the measurement.

Accuracy None

Comments None

References None

4.2.3.3. To apply the correction time-tag BIAS

Function

This sub-function applies a POS2 instrumental correction time bias to the IAT time of the middle of the measurement.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: None
- Computed data: $T_{MID,MID}$, IAT Time of the middle of the measurement.
- Dynamic auxiliary data: None
- Static auxiliary data: ICT, Instrumental Correction Time from POS2 configuration file (see AD9).

Output data

- $T_{COR\_,MID}$ corrected IAT time of the middle of the measurement.

Statement

$T_{COR\_,MID} = T_{MID,MID} + ICT$

Accuracy None

Comments None

References None

4.2.3.4. To locate and determine altitude and orbital altitude rate

Function

This sub-function determines the latitude, the longitude, the altitude and the radial velocity for a given time.

It is called first to estimate the altitude at T_{COR_MID}.

Then it is called to compute altitude, radial velocity and location of the ALTI measurement.

This function is already described in RD2.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: IAT Time.
- Computed data: None
- Dynamic auxiliary data: Segment Navigator Ephemeris from Navigation Data Processing (AD4).
- Static auxiliary data: None

See RD2

Output data

- Latitude, longitude, altitude, radial velocity for the given IAT Time.

Statement

See RD2

The location of ALTI measurement at the beginning and at the end of one data flow is performed using linear extrapolation algorithm if there is no DORIS navigation data corresponding to the ALTI measurement to be located.

Accuracy The precision of the algorithm is better than 10-4 m (TBC) if input data are assumed perfect. The accuracy of this output result for segment navigator ephemeris input is few centimeters in altitude TBC.

Comments None

References None

4.2.3.5. To refer the time-tag to the sea surface

Function

This sub-function corrects the IAT time to get the IAT time of the reflection at the sea surface of the pulse generated at the middle of the measurement.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: None.
- Computed data: $T_{COR\_,MID}$ corrected IAT time of the middle of the measurement
- Dynamic auxiliary data: None
- Static auxiliary data: Velocity of light, (AD9).

Output data

- T: IAT Time of the measurement.

Statement

First, estimate the altitude at T_{COR_MID} with the "To compute altitude, radial velocity and location" function.

Compute T = (Altitude divided by Velocity of Light) + T_{COR_MID}.(TBC)

Accuracy The estimation of the altitude is correct as far as the h_{alt} does not exceed 3000 m (TBC) to respect the error of 10 µs in time-tagging. It is acceptable as very few measurements are done at higher h_{alt}.

Comments This solution prevents level 1.0 from the complex computing of the altitude from tracker range.

References None

4.2.3.6. To check on board tracking and estimates

Function

This sub-function checks ALTI parameters to determine quality flags for:

- tracker AGC in Ku and C band,
- on-board retracked epoch in Ku and C band,
- AGC and powers in Ku and C band,
- Total power of the waveform in the first (and second) window of the trailing edge.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data:
    - Physical values of the parameters of the Raw APID measurement.
- Computed data: None
- Dynamic auxiliary data: None
- Static auxiliary data: Thresholds (see AD9).

Output data

- quality flags for tracker AGC in Ku band,
- quality flags for tracker AGC in C band,
- quality flag for on-board retracked epoch in Ku band,
- quality flag for on-board retracked epoch in C band,
- quality flag for AGC and powers in Ku band,
- quality flag for AGC and powers in C band,
- quality flag for total power of the waveform in the first window of the trailing edge
- quality flag for total power of the waveform in the second window of the trailing edge, associated to each parameter checked

Statement

For each parameter of an ALTI measurement, call “To check a parameter value” and assign the quality flag.

If there is no measurements in the C band, the quality flag is set to “non valid” (instead of missing).

Accuracy None

Comments None

References None

4.2.4. TO COMPLETE ALTIMETER 1.0 PRODUCT WITH SCIENCE RAW DATA

Function

This function is aimed at completing ALTI Level 1.0 product to be used for OFL production by information from the Science Raw data.

Four specific sub-functions identified for this function are:

- To look for ECHO1, ECHO2, ECHO3
- To decompress ECHO1, ECHO2, ECHO3,
- To check restored packets,
- To integrate packets in the Altimeter 1.0 Product.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: ECHO1, ECHO2 and ECHO3 APID and Altimeter 1.0 Product.
- Computed data: None.
- Dynamic auxiliary data: None
- Static auxiliary data: Decommutation Table, Transfer Functions, Thresholds for ECHO parameters, described in AD9.

Output data

- Altimeter 1.0 Product.

Statement

This function reads the Altimeter level 1.0 product and for each product data:

- searches the ECHO packets corresponding to the ALTI packet,
- decompresses the ECHO packets,
- checks the ECHO packets,
- updates the altimeter product data with the ECHO information.

Accuracy None

Comments None

References None

4.2.4.1. To look for ECHO1, ECHO2 and ECHO3

Function

This sub-function is used to look for the ECHO packets of the cycle of an ALTI measurement.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data:
    - raw ECHO1, ECHO2 and ECHO3 measurements,
    - Altimeter level 1.0 product (measurement creation time)
- Computed Data: Creation IAT Time of an ALTI measurement from the Altimeter level 1.0 product
- Dynamic auxiliary data: None
- Static auxiliary data: None.

Output data

- ECHO1, ECHO2 (if any), ECHO3 (if any) measurements.

Statement

There is at least an existing ECHO1 measurement, containing at least 1 packet. An ECHO1 measurement may contain up to 6 first valid packets of the cycle, then an ECHO2 measurement contains the 7 following valid packets, and finally an ECHO3 measurement for the 7 last valid packets (up to Maximum Packets, equal to 20).

Select from the raw ECHO1, ECHO2, ECHO3 measurements the measurements where the creation time is equal to the ALTI measurement creation time.

Accuracy None

Comments None

References None

4.2.4.2. To decompress ECHO1, ECHO2 and ECHO3

Function

This sub-function restores the packets compressed by POS2 to satisfy the TM rate.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: ECHO1, ECHO2 and ECHO3 raw measurements.
- Computed Data: None
- Dynamic auxiliary data: None
- Static auxiliary data: . Decommutation Table, Transfer Functions for the ECHO1, ECHO2, ECHO3 source packets (see AD9).

Output data

- MP restored ECHO packets (MP equals 1 to 20).

Statement

See AD8

Initialise the array of the MP restored packets with a default value.

From ECHO1, ECHO2 and ECHO3:

- Extract the number of valid packets in the measurement,
- Extract the compression parameters,
- For each valid packet:
    - Extract the compressed ECHO packet,
    - Call the decompression algorithm described in AD8,
    - Store the restored packet containing 128 samples. For a 320 MHz bandwidth (in KU or C band) 104 samples are significant, they are centred in the restored packet. For a 100 MHz bandwidth in C band 40 samples are significant, they are stored at the beginning of the 128 samples, and samples 40 to 127 are set to default values).

Accuracy None

Comments If an ECHO measurement is missing, the default value is assigned to the corresponding packets.

References None

4.2.4.3. To check restored packets

Function

This sub-function checks the packets restored by “To Decompress ECHO1, ECHO2 and ECHO3”.

The first check consists of the detection of default values in a packet, the second check consist of the quality control of valid values.

Applicability

CCI/SSALTO and JSDS

Input data

- Product Data: ALTI 1.0 product
- Computed Data:
    - NVP from ALTI 1.0 product
    - restored packets
- Dynamic auxiliary data: None
- Static auxiliary data: Thresholds described in AD9.

Output data

- quality flag: valid, non valid or missing.

Statement

For each packet (1 to MP)

If all the samples are equal to the default value

Quality flag = missing

Else

If a sample is out of the validity domain

Quality flag = non valid

Else

Quality flag = valid

Accuracy None

Comments None

References None

4.2.4.4. To integrate packets in the altimeter 1.0 product

Function

This sub-function completes the altimeter level 1.0 product with the packets and their flags computed by the sub-functions described above.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: Altimeter 1.0 Product.
- Computed data: MP Restored packets and quality flag for each packet.
- Dynamic auxiliary data: None
- Static auxiliary data: None.

Output data

- Altimeter Level 1.0 Product.

Statement

Replace the ECHO information of the Altimeter level 1.0 product by the new one.

Accuracy None

Comments None

References None

4.2.5. TO GENERATE DUMP LEVEL 1.0 PRODUCT

Function

This function describes the generation of the dump level 1.0 product.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: DU measurements
- Computed data: None
- Dynamic auxiliary data: None
- Static auxiliary data: Decommutation Table, Transfer Functions, Thresholds for DU parameters (see AD9).

Output data

- Dump Level 1.0 Product.

Statement

This function generates a DU Level 1.0 product by applying:

- the “To convert UTC time in IAT” function for each measurement,
- the “To Extract a Parameter”, “To Apply a Transfer Function”, “To Check a Parameter Value” functions for each parameter of the DU source packet (see RD4).

Accuracy None

Comments None

References None

4.2.6. TO GENERATE HOUSEKEEPING LEVEL 1.0 PRODUCT

Function

This function describes the generation of the housekeeping level 1.0 product.

Applicability

CCI/SSALTO only

Input data

- Product data: HK measurements
- Computed data: None
- Dynamic auxiliary data: None
- Static auxiliary data: Decommutation Table, Transfer Functions, Thresholds for HK parameters (see AD9).

Output data

- Housekeeping Level 1.0 Product.

Statement

This function generates a HK Level 1.0 product by applying:

- the “To convert UTC time in IAT” function for each measurement,
- the “To Extract a Parameter”, “To Apply a Transfer Function”, “To Check a Parameter Value” functions for each parameter of the HK source packet (see RD4).

Accuracy None

Comments None

References None

4.2.7. TO GENERATE POINT TARGET RESPONSE 1.0 PRODUCT

Function

This function describes the generation of the point target response 1.0 product.

Specific sub-functions identified for this function are:

- To look for time-tag and number of spectra of TC-CAL1
- To order the CAL1 spectrum
- To check the PTR validity.

Applicability

CCI/SSALTO

Input data

- Product data: CAL1 measurements
- Computed data: None
- Dynamic auxiliary data: None
- Static auxiliary data: Decommutation Table, Transfer Functions, Thresholds for CAL1 parameters, nominal TC-CAL1 parameter values (see AD9).

Output data

- Point Target Response 1.0 Product, one for C band and one for Ku Band at each significant segment.

Statement

This function generates the PTR Level 1.O product with each computed PTR sequence, as soon as all expected CAL1 measurements from the telecommand are processed:

Initialise the spectrum with default values.

For each raw CAL1 measurement, apply:

- “To convert UTC time in IAT” to convert the creation time in IAT,
- thanks to the creation time, “Look for time-tag and number of spectra of TC-CAL1” of the CAL1 executed telecommand in the telecommand history.
- “To Extract a Parameter”, “To Apply a Transfer Function” to get CAL1 samples in KU and C band,
- “To order the CAL1 spectrum”

Value:

- the time-tag of the CAL1 sequence with the time-tag of the telecommand,
- the number of spectra in the CAL1 sequence,
- the number of samples of the PTR,
- the sampling frequency,
- the index associated with the zero frequency of the PTR,
- CAG1, CAG2, NIMP and radar configuration.

All these parameters are computed for each CAL1 measurement and must be constant. If not, the quality flag of the parameter is set to non valid.

The parameters of the TC-CAL1 are compared to nominal values. When equal the flag is set to “nominal parameters”, when equal except the number of spectra, the CAL1 processing flag is set to “Different number of spectra”, else the flag is set to “others”

Remark: the use of null values to complete the spectrum is TBC.

Accuracy None

Comments The generation of the point target response level 1.0 product shall be done after the processing and the monitoring of the Housekeeping Level 1.0 product.

References None

4.2.7.1. To look for time-tag and number of spectra of TC-CAL1

Function

This sub-function searches the number of spectra of the telecommand which generates the CAL1 measurements in the telecommand history (this information is not downlinked within the POS2 PLTM).

Applicability

CCI/SSALTO

Input data

- Product data: None
- Computed data: IAT Creation time of a CAL1 measurement.
- Dynamic auxiliary data: Telecommand History (see AD9).
- Static auxiliary data: None.

Output data

- Number of spectra of the telecommand, status of new telecommand.

Statement

Select the CAL1 telecommand just before the creation time CAL1 measurement in the telecommand history.

Extract the number of spectra of the selected telecommand.

If the time-tag of the telecommand differs from the previous telecommand found in the TC history, set the status of new telecommand to YES else to NO.

Accuracy None

Comments None

References None

4.2.7.2. To order the CAL1 spectrum

Function

This sub-function allows to store CAL1 samples in the right order (function of the number of spectra) to get an ordered spectrum.

Applicability

CCI/SSALTO

Input data

- Product data: None
- Computed data:
    - Samples of the CAL1 measurement,
    - CFA of the CAL1 measurement
    - Number of spectra
- Dynamic auxiliary data: None.
- Static auxiliary data: None.

Output data

- Samples of the PTR

Statement

Order and store the samples of the CAL1 as a function of CFA and of the number of spectra.

Accuracy None

Comments None

References None

4.2.7.3. To check the PTR validity

Function

This sub-function checks the PTR.

Applicability

CCI/SSALTO

Input data

- Product data: None
- Computed data: None.
- Dynamic auxiliary data:.
- Static auxiliary data: Thresholds for CAL1 parameters (see AD9).

Output data

- quality flag for each sample and likelihood of the PTR.

Statement

Set the likelihood flag to valid.

For each sample of the PTR,

if its value is the default value, then set the quality flag to “missing”

else

if its value is within the validity domain, then set the quality flag to valid

else set the quality flag to non valid.

If a quality flag is set to non valid or “missing”, set the likelihood flag to non valid.

Accuracy None

Comments None

References None

4.2.8. TO GENERATE LOW PASS FILTER 1.0 PRODUCT

Function

This function describes the generation of the low pass filter level 1.0 product.

Specific sub-functions identified for this function are:

- To look for the number of calibrations
- To order the spectrum
- To check the LPF validity.

Applicability

CCI/SSALTO

Input data

- Product data: CAL2 measurements
- Computed data: None
- Dynamic auxiliary data: None
- Static auxiliary data: Decommutation Table, Transfer Functions, Thresholds for CAL2 parameters, nominal TC-CAL2 parameters (see AD9).

Output data

- Low Pass Filter 1.0 Product, one for C band and one for Ku Band at each significant segment.

Statement

This function generates the LPF Level 1.O product with each computed LPF sequence, as soon as all expected CAL2 measurements from the telecommand are processsed:

Initialise the spectrum with default values.

For each raw CAL2 measurement, apply:

- “To convert UTC time in IAT” to convert the creation time in IAT,
- thanks to the creation time, “Look for time-tag and number of calibrations of TC-CAL2” of the CAL2 executed telecommand in the telecommand history.
- “To Extract a Parameter”, “To Apply a Transfer Function” to get CAL2 samples in KU and C band,
- “To order the CAL2 spectrum”

Value:

- the time-tag of the CAL2 sequence with the time-tag of the telecommand,
- the number of calibration in the CAL2 sequence,
- the number of spectra in the LPF,
- the number of samples of the LPF,
- the sampling frequency,
- the index associated with the zero frequency of the LPF,
- CAG in KU band, CAG in C band, NIMP and radar configuration.

All these parameters are computed for each CAL2 measurement and must be constant. If not, the quality flag of the parameter is set to non valid.

The parameters of the TC-CAL2 are compared to nominal values. When equal the flag is set to “nominal parameters”, when equal except the number of calibration, the CAL2 processing flag is set to “Different number of calibration”, else the flag is set to “others”

Accuracy None

Comments The generation of the low pass filter level 1.0 product shall be done after the processing and the monitoring of the Housekeeping Level 1.0 product.

References None

4.2.8.1. To look for time-tag and number of calibrations of TC-CAL2

Function

This sub-function searches in the telecommand history the number of calibrations of the telecommand which generates the CAL2 measurements (this information is not downlinked within the POS2 PLTM).

Applicability

CCI/SSALTO

Input data

- Product data: None
- Computed data: IAT Creation time of a CAL2 measurement.
- Dynamic auxiliary data: Telecommand History (see AD9).
- Static auxiliary data: None.

Output data

- Number of calibrations of the telecommand, status of new telecommand.

Statement

Select in the telecommand history the CAL2 telecommand just before the creation time CAL2 measurement.

Extract the number of spectra of the selected telecommand.

If the time-tag of the telecommand differs from the previous telecommand found in the TC history, set the status of new telecommand to YES else to NO.

Accuracy None

Comments None

References None

4.2.8.2. To order the CAL2 spectrum

Function

This sub-function allows to store CAL2 samples in the right order (function of CFA) to get an ordered spectrum.

Applicability

CCI/SSALTO

Input data

- Product data: None
- Computed data:
    - Samples (mean and standard deviation) of the CAL2 measurement,
    - CFA of the CAL2 measurement
- Dynamic auxiliary data: None.
- Static auxiliary data: None.

Output data

- Samples of the LPF

Statement

Order and store the samples (mean and standard deviation) of the CAL2 as a function of CFA.

Accuracy None

Comments None

References None

4.2.8.3. To check the LPF validity

Function

This sub-function checks the LPF.

Applicability

CCI/SSALTO

Input data

- Product data: None
- Computed data: None.
- Dynamic auxiliary data:.
- Static auxiliary data: Thresholds for CAL2 parameters (see AD9).

Output data

- quality flag for each sample and likelihood of the LPF.

Statement

Set the likelihood flag to valid.

For each sample of the PTR,

if its value is the default value, then set the quality flag to “missing”

else

if its value is within the validity domain, then set the quality flag to valid

else set the quality flag to non valid.

If a quality flag is set to non valid or “missing”, set the likelihood flag to non valid.

Accuracy None

Comments None

References None

4.2.9. TO GENERATE A REPORT FILE OF LEVEL 1.0 PROCESSING

Function

This function is aimed at producing a report file of the generation of level 1.0 products.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: Level 1.0 products processed.
- Computed data: None.
- Dynamic auxiliary data: None
- Static auxiliary data: None.

Output data

- Report File (see AD11), containing for example Number of Record, Begin Time, End Time for the ALTI product processing report

Statement

Statistics such as count of source packets per APID or TBD are computed.

The statement of this function will be described during the detailed requirements phase.

Accuracy None

Comments The report file generated could be an input of the CMA to inform it about the availability of new products (TBC).

References None

5. "MONITORING" PROCESSING

5.1. PROCESSING OVERVIEW

5.1.1. BRIEF DESCRIPTION

A brief overview of the main functions of the Monitoring processing is given in this section. A detailed description is provided in section 5.2.

The overall monitoring of POS2 is not fully described in this document. This section only deals with the POS2 monitoring performed by CCI/SSALTO and JSDS. See RD5 for a full description of POS2 monitoring.

5.1.2. LIST OF FUNCTIONS

A list of the functions of the POS2 Monitoring processing is given in **Figure 5**.

FUNCTION
TO DETECT NEW RADAR DATABASE PARAMETERS
TO VALIDATE TM VOLUME LIKELIHOOD
TO MONITOR THE BEHAVIOR OF POS2

Figure 5: Functions of the POS2 monitoring processing

5.2. FUNCTIONS

A detailed description of the functions of the Monitoring processing is given in this section.

5.2.1. TO DETECT NEW RADAR DATABASE PARAMETERS

Function

This function analyses the content of the DU level 1.0 product to detect an update of radar database parameters.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: Dump level 1.0 product
- Computed data: None
- Dynamic auxiliary data: None
- Static auxiliary data: RDB parameters (define in AD9).

Output data

- New RDB parameters if any.

Statement

This function compares the content of RDB parameters (TBD in RD4) in the DU level 1.0 product with the content of their static version.

If a difference appears, a new version of static RDB parameters is generated and a return status indicates the change.

Accuracy None

Comments None

References None

5.2.2. TO VALIDATE TM VOLUME LIKELIHOOD

Function

This function checks the operation of the altimeter by estimation of the number of expected source packets during a visibility segment.

Statistics of ALTI source packets are sufficient to detect an anomaly.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data: ALTI Report File from “To Generate a Report File”
- Computed data: Statistics on the Number of Record of the ALTI product, Begin Time and End Time from the Report File,
- Dynamic auxiliary data: None
- Static auxiliary data: Rate and Acceptable Percentage of error of the estimation, in POS2 configuration file, defined in AD11.

Output data

Quality status

Statement

This function computes a statistic of expected ALTI measurements, N_{EAM}.

From POSEIDON1, these statistics are computed with the following formula:

N_{EAM} = (Tend - Tbegin) * Rate (Rate=0.9 for POSEIDON1, TBC for POS2)

where the End Time and Begin Time of the measurements during this data segment are expressed in seconds.

Compare statistics on the Number of Record (N_R) of the ALTI product from the report file with the number of expected measurements.

Return a quality status to KO if (abs (N_{EAM} – N_R)*100. / N_{EAM}) > Tolerance) (Tolerance = 20 TBC).

Accuracy None

Comments Rate and Tolerance are values that may be tuned during POS2 operations.

References None

5.2.3. TO MONITOR THE BEHAVIOUR OF POS2

Function

This function shows the operation of POS2 by visualisation of its operating mode over the Earth.

Applicability

CCI/SSALTO and JSDS

Input data

- Product data:
    - acquisition level 1.0 product,
    - altimeter level 1.0 product.
- Computed data: None
- Dynamic auxiliary data: Segment Navigator Ephemeris
- Static auxiliary data: graphics environment.

Output data

Map representing the operating mode of POS2 over a segment visibility or a period defined by the operator.

Statement

This function reads data from the ACQ level 1.0 product and the ALTI level 1.0 product and an ephemeris.

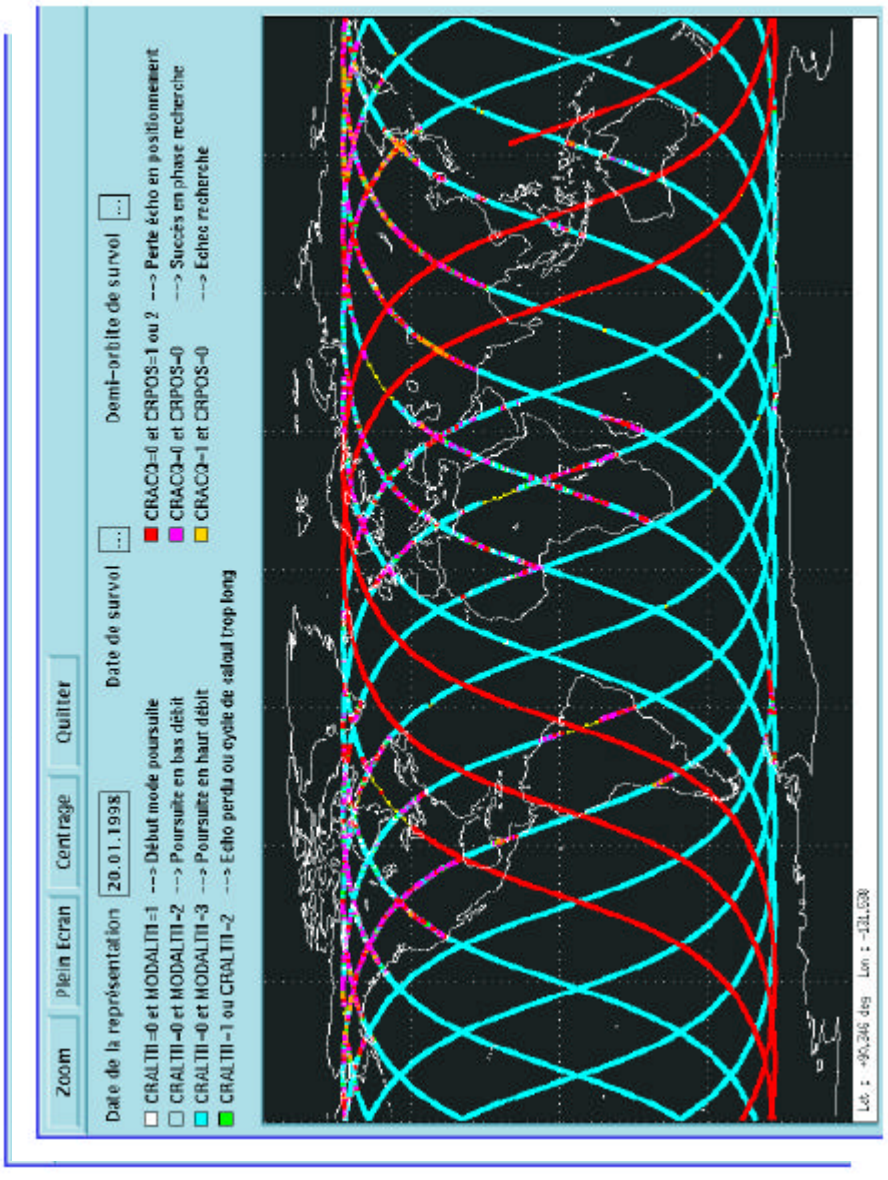
Then it represents the operating mode of POS2 above the Earth. An example of the result (from POSEIDON1) is given in **Figure 6**.

Accuracy None

Comments None

References None

Figure 6 Operating Mode of POS2



Reference document : SMM-ST-M-EA-11441-CN
Document title : Poseidon 2 level 1.0 processing

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